Sanskruti Jadhav

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Technical Skills:

- **Programming languages**: C++, Python, ROS, MATLAB, Shell Scripting
- **Tools/Software**: Irrlicht Engine, Gazebo, Unity, Isaac Sim Simulators, MATLAB and Simulink, Git, Docker, Visual Studio Code, Linux OS, Vector CANdb++, Docker
- **Skills:** Sensor Data Analysis (2D and 3D LiDAR, Camera, GNSS, Ultrasonic), CAN signal processing, ROS-CAN interfacing, Filtering Applications (Kalman, EKF, Particle), Image Processing Analysis, Machine Learning, Deep Learning, and Deep Reinforcement Learning, Project Management
- **Framework**: ROS, Open AI Gym Chrono, Project chrono, PyTorch, TensorFlow

Work Experience:

Clemson University International Center for Automotive Research (CUICAR)

1. **Autonomous Driving Software Engineer | Deep Orange Link** **Jan 2022 – Current**

- Developed 3 ton Autonomous off-road vehicle prototype in Deep Orange educational program.
- Implemented full stack waypoint navigation and tuned the motion planning algorithm for smooth navigation.
- Deployed ROS MATLAB interface for continuous real-time monitoring of vehicle states and logging Data.
- Programmed ROS CAN bridge to check ROS connectivity and publishing – subscribing commanded velocities to the CAN bus on vehicle.
- Analyzed and debugged vehicle localization problem of lateral position-drift through troubleshooting using GNSS sensor data.
- Integrated sensor drivers of LiDAR, Cameras, GNSS in the Autonomy stack.

2. **Graduate Research Assistant | Automation Robotics and Mechatronics Lab May 2022 – Current**

- Demonstrated Deep Reinforcement Learning on High Mobility Multipurpose Wheeled Vehicle for steering control on off road terrain environment.
- Deployed the project on Docker- Singularity Containerization platforms to utilize high performance computing infrastructure at Clemson for training of the model.

Achievements:

- Published (first author) research paper on Containerization Approach for High Fidelity Terramechanics Simulations at the SAE International WCX world congress experience. **Link**
- Contributed to an Open-source project of Project Chrono & Pychrono platform by submitting my customized Docker Image.

Senior Engineer Project Component Manager | Bosch Chassis India **Sept 2018 – Jun 2021**

- Worked on New product development of sensors of Anti-lock Braking System (ABS) and Electronic Stability Program (ESP) for Indian Original Equipment manufacturers of Cars and two-wheelers.
- Collaborated with Cross Functional Teams to efficiently provide solutions to the OEM customer.
- Collaborated in the Advanced Product Quality Planning (APQP) process in the product development cycle.

Education:

Clemson University, Master of Science **Aug 2021 – Current**
Major: **Automotive Engineering Specialization in Vehicle Autonomy,** GPA 3.76 / 4.0 **Clemson, USA**

Relevant Courses: Autonomy Science and Systems, Deep Learning, Machine Perception for Autonomy, High Performance Computing and Simulations, Electronic Integration and Controls, System Engineering, Software Design patterns, Data Structures and Algorithms, Motion Planning

University of Pune, Bachelor of Engineering, **Aug 2013 – May 2017**
Major: **Mechanical Engineering**, GPA 3.50 / 4.0 **Pune, India**
Relevant Courses: Vehicle Dynamics, Automotive Control Systems, Automotive Electronics

Academic Projects:

- **Autonomous navigation of Vehicle in Rough terrain** – MathWorks MATLAB excellence in Innovation program
  - Simulated Waypoint navigation and RRT* path planning algorithm on Turtlebot using Gazebo and Simulink.
- **Adaptive Cruise control and emergency stopping implementation on RC CAR**
  - Tuned the RC Car for lane following, emergency stopping and adaptive cruise control using PID controller and ultrasonic sensors.
  - Applied Kalman Filter to the noisy sensor data of all the ultrasonic sensors.
- **Autonomous Navigation of Turtlebot3 burger**
  - Controlled navigation of Turtlebot equipped with LIDAR and camera in dynamic obstacle environment.
  - Demonstrated Turtlebot April tag, line following and stop sign detection tasks using YOLO v3 using camera sensor mounted on the bot.
  - Demonstrated person following ability of the Turtlebot using 2D Lidar sensor mounted on the bot.
- **Deep Learning Drivable area detection for inclement weather**
  - Modelled a convolutional neural network for detecting drivable area (segmented) in inclement weather images from BDD100k Dataset.
  - Tested Model on inclement weather videos which resulted mean IOU score of 44.15%.
- **Implementing Search based algorithm for path planning.**
  - Modelled function to output path costs based on different algorithms:
    a. Depth-first Search and Breadth-first search cost
    b. A*, RRT*, Dijkstra
- **Perception Projects for Vehicle Autonomy**
  - Applied edge detection techniques such as Hough transform, canny edge in the image.
  - Implemented Image Processing and Denoising techniques such as histogram matching, Kalman filtering on images.
  - Designed Parking spot detection algorithm using RealSense L515 Camera sensor.
- **Halloween themed Witch game development using Software Design Patterns**
  - Developed game using python object-oriented programming and software design patterns such as Singleton, Factory and Cloning Pattern.
  - Practiced Clean Coding and GIT version control techniques during implementation of this project.

Certifications:

- MathWorks Excellence in Innovation program Accepted solution to project 209 YouTube tutorial
- Nvidia Fundamentals of Deep Learning
- Machine Learning Specialization Coursera by Andrew Ng
- AWS Essential Training for Developers & Learning Amazon Web Services (AWS) for Developers
- Cisco Networking Foundation